CLAIMS:

1. A process for the formation of particulate material of a desired substance comprising:

(i) charging a particle formation vessel, the temperature and pressure in which are controlled, with a supercritical fluid;

(ii) agitating the contents of the particle formation vessel with a rotary agitator comprising an impeller having an impeller surface and an impeller diameter, creating a relatively highly agitated zone located within a distance of one impeller diameter from the surface of the impeller of the rotary agitator, and a bulk mixing zone located at distances greater than one impeller diameter from the surface of the impeller;

(iii) introducing into the agitated particle formation vessel at least a first feed stream comprising at least a solvent and the desired substance dissolved therein through a first feed stream introduction port and a second feed stream comprising the supercritical fluid through a second feed stream introduction port, wherein the desired substance is relatively insoluble in the supercritical fluid relative to its solubility in the solvent and the solvent is soluble in the supercritical fluid, and wherein the first and second feed stream introduction ports are located within a distance of one impeller diameter from the surface of the impeller of the rotary agitator such that the first and second feed streams are introduced into the highly agitated zone of the particle formation vessel and the first feed stream is dispersed in the supercritical fluid by action of the rotary agitator, allowing extraction of the solvent into the supercritical fluid, and

(iv) precipitating particles of the desired substance in the particle formation vessel with a volume-weighted average diameter of less than 100 nanometers.

2. A process according to claim 1, further comprising (v) exhausting supercritical fluid, solvent and the desired substance from the particle formation vessel at a rate substantially equal to the rate of addition of such components to the vessel in step (iii) while maintaining temperature and pressure

in the vessel at a desired constant level, such that formation of particulate material occurs under essentially steady-state continuous conditions.

3. A process according to claim 2, wherein the supercritical fluid, solvent and desired substance are exhausted from the particle formation vessel by passage to an expansion chamber.

4. A process according to claim 3, wherein the supercritical fluid, solvent and desired substance are exhausted from the particle formation vessel by passage through a backpressure regulator.

5. A process according to claim 3, wherein the supercritical fluid, solvent and desired substance are exhausted from the particle formation vessel by passage through a capillary.

6. A process according to claim 3, wherein the supercritical fluid, solvent and desired substance are exhausted from the particle formation vessel by passage through a flow distributor.

7. A process according to claim 3, further comprising collecting particles of the desired substance in the expansion chamber.

8. A process according to claim 1, wherein the supercritical fluid, solvent and desired substance are exhausted from the particle formation vessel directly into a solution to form a dispersion of the formed particles of the desired substance.

9. A process according to claim 1, wherein particles of the desired substance are precipitating in the particle formation vessel with a volume-weighted average diameter of less than 50 nanometers.

10. A process according to claim 1, wherein particles of the desired substance are precipitating in the particle formation vessel with a volume-weighted average diameter of less than 10 nanometers.

11. A process according to claim 10, wherein the coefficient of variation of the particle size distribution of the particles of the desired substance precipitated in the particle formation vessel is less than 50%.

12. A process according to claim 11, wherein the coefficient of variation of the particle size distribution of the particles of the desired substance precipitated in the particle formation vessel is less than 20%.

13. A process according to claim 1, wherein the coefficient of variation of the particle size distribution of the particles of the desired substance precipitated in the particle formation vessel is less than 50%.

14. A process according to claim 13, wherein the coefficient of variation of the particle size distribution of the particles of the desired substance precipitated in the particle formation vessel is less than 20%.

15. A process according to claim 1, wherein the desired substance comprises a colorant.

16. A process according to claim 15, wherein the desired substance comprises a dye.

17. A process according to claim 1, wherein the desired substance comprises a pharmaceutically useful compound.

18. A process according to claim 1, wherein the desired substance comprises a compound used to make organic electroluminescent devices.